PLASTICS & RUBBER WEEKLY

p. 1.

NOVEMBER 28, 1969 No. 304

Burning pvc not a major hazard

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THE incineration of pvc among other waste products will present no major health hazard into the 1980's — this is the main conclusion of what will be the most controversial paper delivered at the Scanplant 69 conference which ran concurrently with the exhibition in Gothenburg, Sweden, this week.

However, the findings will carry great weight as it is the work of a completely independent body.

It is the work of IVA, the Royal Academy of Engineering Sciences.

The academy celebrated its 50th anniversary during October this year.

The findings do not ignore the fact that incineration of pvc causes pollution of the atmosphere, but does suggest that the amount of hydrochloric acid formed is insignificant when compared with the amount of sulphuric acid which is formed due to burning oil — for central heating installations, for example.

The report also takes into account that pvc will only form a small percentage of collected waste which is incinerated, and allows for the increasing use of pvc into the 1980s.

The report is, of course, prepared on the usage of pvc in Sweden which run at about 60,000 ton (metric) during 1968, and forecast to rise in 1m—300,000 ton in 1980.

The Royal Academy estimated that during 1968 6,000 ton of pvc went to waste, of which 1,020 ton was burnt. Forecast for 1980 suggests that 30,000 ton will come up as waste, of which 12,000 ton of this pvc will be burnt.

From these tonnages, it is deduced that 600 ton of hydrochloric acid was produced in the atmosphere in 1968, a figure which will rise to 7,000 in 1980.

The final conclusion is that the amount of pollution due to burning pvc will only represent 0.5 per cent of the total from other sources in 1980 and that in 1968 the figure was 0.05 per cent.

□ marketing information

PVC rise reflects VC tightness

ANOTHER RISE IN THE price of PVC has taken place in the UK. ICI has announced that it will raise the price of the material by 7 per cent from February 9. It is understood that the announcement took the other major UK producer, BP Chemicals, by surprise and that it immediately put an application for a price increase before the UK Board of Trade.

ICI states that consequential rises in the price of PVC compounds and powder blends will be made at the same time, taking into account the current changes in raw material costs. While there will be no change in the price of plasticized compounds and powder blends with a BS softness greater than 50 those with a BS softness of 50 or less will be increased by £3·5 ($8·4)/metric ton and the price of unplasticized PVC will be increased by £7 ($16·8)/metric ton.

Previous price increases in the UK were a 7 per cent rise last year and a 6 per cent increase the year before after devaluation of sterling. In all prices have risen by around 20 per cent.

Recently in the UK there has been a decrease in the price of phthalate plasticizers of between £4·5 and £7/ton.

No reasons for the increase in prices have been given by either ICI or BP. The rise may reflect a rise in the price of vinyl chloride. Capacity for this monomer is not in excess of demand in the EEC. Most producers appear to agree that the vinyl chloride/PVC demand is roughly in balance.

Nevertheless, there is a strong import market. Conoco Chemicals, for example, is said to be bringing more than 100 000 ton/year into Western Europe. This company has recently announced an increase in vinyl chloride prices. These are raised from $4·75/lb to $5·0/lb, f.o.b. Lake Charles, La. Conoco relates the increase to rising costs.

In the past exceptionally strong competition and over-capacity had reflected in a continually decreasing price for both vinyl chloride and for PVC. Now that the materials are relatively tight prices are establishing themselves at an "economic" level.

In general it is thought that prices will not rise higher for vinyl chloride in the immediate future but will remain steady at their current level of around £60-£65/ton. In the near future, say, late 1971 observers forecast a drop in prices.

This will be a reflection, presumably, of the operation of the large vinyl chloride plants being built, for example, by Dutch State Mines and KZO each with a capacity of around 300 000 ton/year and intended to help create and supply a merchant market for vinyl chloride.

Thereafter, by the mid-70s, prices are likely to rise again. It is thought that this rise will reflect increases in the cost of chlorine and of ethylene.

OLI 7643

SAFETY

decomposition of PVC yields a hazardous gas

WHEN POLYVINYL CHLORIDE (PVC) wire insulation is heated it goes through two stages of decomposition. In the second phase, where high levels of heat are involved, the decomposition yields the familiar dark sooty smoke.

In the initial stage, however, when the level of heat input is relatively low, a white hydrochloric acid mist is generated. The mist is formed when the colorless hydrogen chloride (HCl) gas, which is released, combines with moisture in the air.

The release of hydrogen chloride prior to the development of dense smoke presents a potentially hazardous situation because the HCl, either as the gas or the acid, acts as a primary irritant and corrosive agent to the respiratory system. It also is adsorbed on contact with surfaces, such as the skin.

Gaseous hydrogen chloride is released from PVC at about 230 C. The rate of release depends on the temperature and density of the material. If the temperature is maintained below 340 C, dark smoke or soot will not form. It is only above 340 C that the dark smoke or carbonaceous degradation products are formed.

In studies at the Building Research Div. of the National Bureau of Standards, Washington, D.C., the combustion products from only 42 cm^2 of sample surface reached a HCl concentration of above 1,600 ppm. in a 0.5-m^3 test chamber.

From 1,000 to 2,000 ppm of hydrogen chloride is considered dangerous on short exposure. It requires 5,000 to 10.000 ppm of carbon monoxide to create a dangerous atmosphere. □